CLAIMS:

1. A process for the production of alcohols, comprising:

(a) subjecting an olefin to a hydration reaction with water to form a reaction product including the corresponding alcohol, the olefin having a carbon chain of 2 to 12 carbon atoms, the carbon chain being selected from a linear chain and a branched chain , the reaction being conducted in the presence of a solid state olefin hydration catalyst, the temperature and pressure of the hydration reaction being selected so that the olefin is largely in a vapour phase and the alcohol is in the liquid phase ,the olefin being in a molar excess when compared with water; and

(b) simultaneously recovering the alcohol as a substantially anhydrous liquid.

2. A process according to Claim 1, wherein the catalyst has hydrophobic properties.

3. A process according to Claim 2, wherein the reaction in step (a) is effected by catalytic distillation.

4. A process according to Claim 1, wherein step (a) is effected at a pressure of 0.1 to 4 MPa.

5. A process according to Claim 4, wherein step (a) is effected in a temperature range of
50-225 ^{0}C.

6. A process according to Claim 5, wherein the feed ratio of water to olefin is in the range of 1:3 to 1:5.

7. A process according to Claim 6, wherein the pressure is about 2 kPA.

8. A process according to Claim 7, wherein the olefin has a carbon chain of 2-4 carbon atoms.

9. A process according to Claim 8, wherein the catalyst is a silicate, having a highly regular crystallographic structure characterized by a large surface area, and interconnected cavities within the regular structure.

10. A process according to Claim 8, wherein the olefin is propene, and the corresponding alcohol is isopropanol.

11. A process according to Claim 8, wherein the olefin is isobutene, and the corresponding alcohol is tertiary butanol.

12. A process for the production of alcohols, comprising

(a) subjecting an olefin to a hydration reaction with water to form a reaction product including the corresponding alcohol, the olefin having a carbon chain of 2 to 12 carbon atoms, the carbon chain being selected from a linear chain and a branched chain and a chain having a cyclic hydrocarbon component ,the reaction being conducted by catalytic distillation in a distillation column in the presence of a solid phase hydrophobic olefin hydration catalyst, the catalyst being disposed within the column in two separate spaced apart catalytic beds, the temperature and pressure of the hydration reaction being selected so that the olefin is largely in a vapour phase and the alcohol is in the liquid phase , the olefin being in a molar excess when compared with water, the olefin and water being continuously fed to the column ; and

(c) simultaneously and continuously recovering the alcohol as a substantially anhydrous liquid.

13. A process according to Claim 12, wherein step (a) is effected at a pressure of 0.1-4 MPa, and a temperature in the range of 50—225 ^{0}C.

14. A process for reducing the water content of an azeotropic mixture of a first alcohol and water, comprising:

(a) effecting a hydration reaction of the water content of the azeotropic mixture with an olefin, wherein the olefin is hydrated to a corresponding second alcohol, the second alcohol being selected from the group consisting of the same alcohol as the first alcohol, an alcohol readily separable from the first alcohol by a distillation procedure, and an alcohol forming a useful mixture when mixed with the first alcohol, the hydration reaction of the olefin being conducted in the presence of a solid phase olefin hydration catalyst, the temperature and the pressure of the hydration reaction being selected so that the olefin is largely in the vapour phase and the first alcohol and the second alcohol are each largely in a liquid phase, the olefin being in a molar excess when compared with the water content of the azeotropic mixture, and

(b) continuously removing the first alcohol and the second alcohol as a substantially anhydrous liquid mixture.

15. A process according to Claim 14, wherein the catalyst has hydrophobic properties.

16. A process according to Claim 15, wherein step (a) the reaction is performed at a temperature and pressure selected so ~~that~~ the rate of hydration reaction is high, and conversion of the olefin to the corresponding second alcohol is favored over conversion to the corresponding ether.

17. A process according to Claim 16, wherein the reaction in step (a) is effected by catalytic distillation.

18. A process according to Claim 16, wherein the second alcohol is different from the first alcohol.

19. A process according to Claim 17, wherein the second alcohol is of a higher molecular weight than the first alcohol.

20. A process according to Claim 16, wherein the first alcohol is ethanol, the added olefin has at least about five carbon atoms.

21. A process according to Claim 16, wherein the first alcohol is ethanol, and the olefin is 2-methyl-2-butene.

22. A process according to Claim 16, wherein the catalyst is a silicate, having a highly regular crystallographic structure characterized by a large surface area, and interconnected cavities within the regular structure.

23. A process for reducing the water content of an azeotropic mixture of a first alcohol and water, comprising

(a) effecting a hydration reaction of the water content of the azeotropic mixture with an olefin, wherein the olefin is hydrated to a corresponding second alcohol, the second alcohol being selected from the group consisting of the same alcohol as the first alcohol, an alcohol readily separable from the first alcohol by a distillation procedure, and an alcohol forming a useful mixture when mixed with the first alcohol, the hydration reaction of the olefin being conducted in the presence of a solid phase hydration catalyst, the temperature and the pressure of the hydration reaction being selected so that the olefin is largely in the vapour phase and the first alcohol and the second alcohol are each largely in a liquid phase, the olefin being in a molar excess when compared with the water content of the azeotropic mixture, the hydration reaction being conducted by catalytic distillation in a distillation column in the

presence of a solid phase hydrophobic olefin hydration catalyst, the catalyst being disposed within the column in a plurality of spaced apart catalytic beds, the olefin and the azeotropic mixture being continuously fed to the column , and

(b) continuously removing the first alcohol and the second alcohol as a substantially anhydrous liquid mixture.

24. A process according to Claim 23, wherein step a) the temperature and pressure are selected so that the rate of the hydration reaction is high, conversion of the olefin to the corresponding second alcohol is favored over conversion to the corresponding ether, and etherification of the olefin does not occur to a measurable degree.

25. A process according to Claim 23, wherein step (a) the pressure is 0.25-2.5 and the temperature is 70-180 ^{0}C.

26. A process according to Claim 25, wherein the silicate is sulfated.

27. A process according to Claim 24, wherein the catalyst is a silicate, having a highly regular crystallographic structure characterized by a large surface area, and interconnected cavities within the regular structure.

28. A process according to Claim 27, wherein the silicate is sulfated.

29. A process according to Claim 9, wherein the silicate is sulfated.